

Low-energy Planetary Excavator (LPE), Phase II

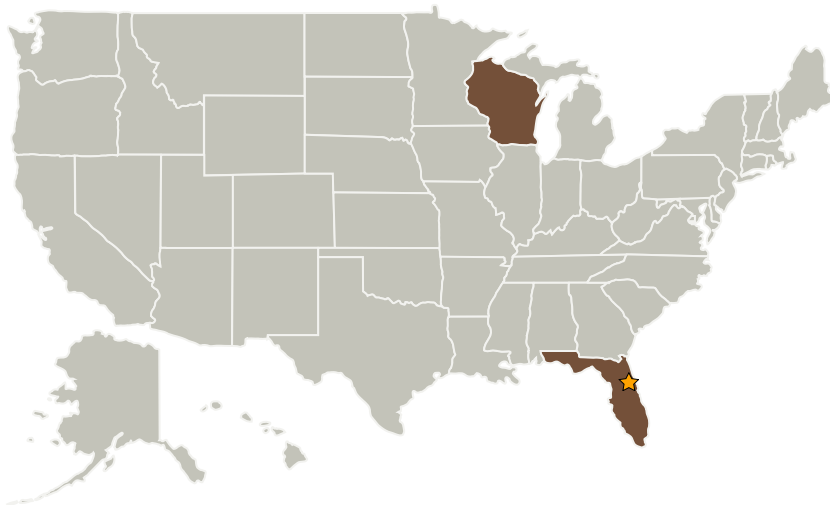
Completed Technology Project (2006 - 2008)



Project Introduction

ORBITEC is developing an innovative Low-energy Planetary Excavator (LPE) to excavate in situ regolith, ice-regolith mixes, and a variety of other geologic materials to support future activities on the Moon and Mars. The LPE utilizes an innovative cutterhead to efficiently excavate a wide range of different planetary surface materials. Current mechanical excavators mount a fixed array of rock cutting tools on a cutterhead that operates efficiently only in a narrow range of material conditions. The LPE would be able to accommodate the different materials that are encountered on planetary surfaces. The LPE will sense geologic changes and respond with changes to achieve the lowest cutting energy possible. The result is a flexible machine with reduced power requirements. A large LPE would be used to mine ice deposits and regolith for processing, and to excavate openings for habitats and shielding. A small LPE would be used for exploration. One LPE would be simpler and easier to maintain than a stable of excavators, each for a specific geology or application. Phase II will further define the properties of the ice-regolith mixtures and then design, develop, test, and deliver a functional prototype LPE unit to NASA.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Orbital Technologies Corporation	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Madison, Wisconsin

Primary U.S. Work Locations

Florida	Wisconsin
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
 - └ TX07.1 In-Situ Resource Utilization
 - └ TX07.1.2 Resource Acquisition, Isolation, and Preparation